CONDUCTOR INSULATION TYPES: 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR

SIZES OF CONDUCTORS AND CABLES INDICATED OR SPECIFIED ARE IN AMERICAN WIRE GAGE (AWG — BROWN AND SHARPE).

ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS NO. 8 AWG AND LARGER:

ALL CONDUCTORS, NO. 10 AWG AND SMALLER: SOLID COPPER

ALL BRANCH CIRCUIT WIRING: NOT SMALLER THAN NO. 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE (OCPD) RATING AND NUMBER OF POLES. WHERE NO CIRCUIT SIZE (I.E., CONDUCTORS AND OCPD) IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO. 12 AWG CONDUCTORS, IN 3/4-INCH RACEWAY, AND A 20A CIRCUIT BREAKER.

CONTROL WIRING: STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE: NO. 14 AWG, UNLESS NOTED OTHERWISE.

FLEXIBLE CORDS AND CABLES: STRANDED COPPER CONDUCTORS FOR ALL, UNLESS NOTED OTHERWISE.

SPECIAL PURPOSE CONDUCTORS AND CABLES. SUCH AS LOW VOLTAGE CONTROL AND SHIELDED INSTRUMENT WIRING: UNLESS INDICATED OTHERWISE, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

TYPE MC CABLE: 600V, UNJACKETED; ANSI E119 AND E814, UL STANDARDS 44 OR 83 (AS APPLICABLE), AND 1569, NFPA 70 ARTICLE 330; ALUMINUM OR GALVANIZED STEEL INTERLOCKED ARMOR; THHN- OR XHHW-INSULATED CONDUCTORS; COLOR CODE: ICEA METHOD 1, WITH GREEN INSULATED GROUNDING CONDUCTOR

16B INSTALLATION OF CONDUCTORS AND CABLES

Revision

INSTALL ALL WIRING IN APPROVED RACEWAY AND ENCLOSURES, EXCEPT: WHERE SPECIFIED OR INDICATED FOR LOW-VOLTAGE WIRING

WHERE SPECIFIED OR INDICATED FOR DIRECT-BURIED CABLES WHERE TYPE MC CABLE IS INDICATED OR SPECIFIED AS ACCEPTABLE

INSTALL ALL CONDUCTORS AND CABLE IN RACEWAYS CONTINUOUS WITHOUT TAPS OR SPLICES. SPLICE OR TAP ONLY IN APPROVED BOXES AND ENCLOSURES WITH APPROVED SOLDERLESS CONNECTORS, OR CRIMP CONNECTORS AND TERMINAL BLOCKS FOR CONTROL WIRING, AND KEEP TO THE MINIMUM REQUIRED. INSULATE ALL SPLICES, TAPS, AND JOINTS AS REQUIRED BY CODES.

ALL MATERIALS USED TO TERMINATE, SPLICE OR TAP CONDUCTORS: DESIGNED FOR. PROPERLY SIZED FOR, AND UL LISTED FOR THE SPECIFIC APPLICATION AND CONDUCTORS INVOLVED. AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, USING THE MANUFACTURER'S RECOMMENDED TOOLS.

WHERE WIRING IS INDICATED AS INSTALLED, BUT THE CONNECTION IS INDICATED "FUTURE" OR "BY OTHER DIVISION, TRADES, OR CONTRACTS", LEAVE A MINIMUM 3-FOOT "PIGTAIL" AT THE BOX, TAPE THE ENDS OF THE CONDUCTORS, AND COVER THE

IN GENERAL, THE DIRECTION OF BRANCH CIRCUIT "HOME RUN" ROUTING IS INDICATED ON THE DRAWINGS, COMPLETE WITH CIRCUIT NUMBERS AND PANELBOARD DESIGNATION. CONTINUE ALL SUCH "HOME RUN" WIRING TO THE DESIGNATED PANELBOARD, AS THOUGH "CIRCUIT RUNS" WERE INDICATED IN THEIR

THE NUMBER OF CONDUCTORS IN A SPECIFIC RACEWAY "HOME RUN" IS INDICATED WITH CROSS LINES (TICK MARKS) ON EACH "CIRCUIT RUN" ON THE DRAWINGS.

COMMON OR SHARED NEUTRALS ARE NOT ALLOWED UNLESS SHOWN ON THE DRAWINGS TO BE USED OR SPECIFICALLY NOTED TO BE ALLOWED.

WHERE MULTI-WIRE BRANCH CIRCUITS (I.E., SHARED NEUTRAL) ARE ALLOWED, THEY SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT THE BRANCH CIRCUIT ORIGINATES. MULTI-POLE BREAKERS OR 3 SINGLE POLE BREAKERS WITH A HANDLE TIE ARE TWO

WHEN MULTIPLE HOME RUNS ARE COMBINED INTO A SINGLE RACEWAY SUCH THAT THE NUMBER OF CONDUCTORS EXCEEDS FOUR (CONDUCTOR COUNT IS MADE UP OF ANY COMBINATION OF PHASE AND NEUTRAL CONDUCTORS), THE FOLLOWING RESTRICTIONS APPLY, WHICH ARE IN ADDITION TO THOSE IN NFPA 70:

NORMAL OR NON-ESSENTIAL CIRCUITS.

MAXIMUM OF 16 CONDUCTORS IN A SINGLE RACEWAY. FOR UP TO EIGHT CONDUCTORS IN A RACEWAY, MINIMUM RACEWAY SIZE: 3/4-INCH. FOR GREATER THAN EIGHT CONDUCTORS, MINIMUM RACEWAY SIZE: 1-INCH. DO NOT INSTALL ANY OTHER TYPE OF CIRCUIT IN THIS RACEWAY.

THE MINIMUM WIRE SIZE FOR ALL CONDUCTORS IN THIS RACEWAY: NO. 10 AWG. ONLY 15A AND 20A BRANCH CIRCUIT HOMERUNS MAY BE COMBINED INTO ONE RACEWAY.

DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT.

FOR BRANCH CIRCUITS FED FROM GFCI CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCI CIRCUIT.

PROPERLY IDENTIFY ALL TERMINAL BLOCKS AND WIRE TERMINALS FOR CONTROL WIRING WITH VINYL STICK-ON MARKERS OR EQUIVALENT. PROVIDE ENGINEER WITH A LIST OF PROPOSED IDENTIFYING NUMBERS FOR REVIEW PRIOR TO INSTALLING

PROVIDE AN EQUIPMENT-GROUNDING CONDUCTOR, OR BONDING JUMPER, AS APPLICABLE, IN ALL FEEDERS AND BRANCH CIRCUITS, SIZED IN ACCORDANCE WITH NFPA 70 TABLES 250.66 OR 250.122, AS APPLICABLE, UNLESS INDICATED AS LARGER ON THE DRAWINGS.

VOLTAGE DROP IN BRANCH CIRCUITS SHALL NOT EXCEED 3 PERCENT.

WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW UNLESS THERE IS A COLOR SYSTEM CURRENTLY IN USE BY THE FACILITY, IN WHICH CASE THE COLORS ARE TO MATCH THE EXISTING SYSTEM. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL

SYSTEM VOLTAGE

240V AND UNDER, INCLUDES - 208Y/120, 120/240, 120/208, 240D/120 SYSTEMS PHASE B - RED PHASE C - BLUE NEUTRAL - WHITE

USE OF MC CABLE MAY ONLY BE USED:

> IN LIEU OF FLEXIBLE CONDUIT AND WIRING FROM LIGHT FIXTURES IN ACCESSIBLE CEILINGS TO JUNCTION BOXES (ATTACHED TO BUILDING STRUCTURE) ABOVE THE CEILING. PROVIDE CABLE WHIPS OF SUFFICIENT LENGTHS TO ALLOW FOR RELOCATING EACH LIGHT FIXTURE WITHIN A 5-FOOT RADIUS OF ITS INSTALLED LOCATION, BUT NOT EXCEEDING 6 FEET IN UNSUPPORTED LENGTHS.

FOR VERTICAL DROPS IN STUD WALLS.

EQUIPMENT GROUND GREEN

ISOLATED GROUND - GREEN W/YELLOW STRIPE.

IN LIEU OF EMT, ONLY FOR 15A AND 20A BRANCH CIRCUITS (WITH UP TO FOUR (4) CONDUCTORS, NOT INCLUDING GROUND CONDUCTOR), AND ONLY IN DRY CONCEALED LOCATIONS ABOVE GRADE, EXCEPT WHERE SPECIFICALLY NOT PERMITTED BY NFPA 70.

MC CABLE SHALL NOT BE USED FOR ANY USE NOT LISTED ABOVE. EXAMPLES OF THOSE USES INCLUDE, BUT ARE NOT LIMITED TO:

HOMERUNS TO PANELBOARDS. WHERE EXPOSED TO VIEW. WHERE EXPOSED TO DAMAGE. HAZARDOUS LOCATIONS. WET LOCATIONS. WHEN RESTRICTED OTHERWISE.

WHEN SPECIFICALLY DISALLOWED BY THE LOCAL AHJ. WHEN SPECIFICALLY DISALLOWED BY THE LANDLORD. CIRCUITS THAT CAN BE SUPPLIED BY AN EMERGENCY OR STANDBY POWER

EMERGENCY, OPERATING AND ICU ROOMS.

16B JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS

PROVIDE JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS WHEREVER NECESSARY FOR PROPER INSTALLATION OF VARIOUS ELECTRICAL SYSTEMS ACCORDING TO NFPA 70 AND WHERE INDICATED ON THE DRAWINGS. SIZE AS REQUIRED FOR THE SPECIFIC FUNCTION OR AS REQUIRED BY NFPA 70, WHICHEVER IS LARGER. CONSTRUCTION SHALL BE OF A NEMA DESIGN SUITABLE FOR THE ENVIRONMENT INSTALLED.

JUNCTION BOXES INSTALLED BEHIND WALL CASES, AND IN OR ON OTHER STORE FIXTURES, EXCEPT WHERE OTHERWISE SPECIFIED, SHALL BE 4-INCH SQUARE OR LARGER, WITH GALVANIZED COVERS.

HORIZONTALLY MOUNT JUNCTION BOXES UNDER CENTER FIXTURES (AND CASES), HANDY BOXES OR 4-INCH SQUARE BOXES WITH TOPS OF BOXES NOT MORE THAN 3-1/2 INCHES ABOVE THE FLOOR. SIZE JUNCTION BOXES TO ADEQUATELY CONTAIN ALL REQUIRED CONDUCTORS AND SPLICES.

16B MOUNTING HEIGHTS

UNLESS NOTED OTHERWISE, INSTALL WIRING DEVICES AS INDICATED BELOW (NOTE: ALL DIMENSIONS ARE TO THE BOTTOM OF THE OUTLET BOX UNLESS NOTED

GENERAL: TOP OF OUTLET BOX A MAXIMUM OF 48 INCHES ABOVE FINISHED FLOOR. ALL SWITCHES SHALL BE MOUNTED AT THE SAME HEIGHT THROUGHOUT THE PROJECT UNLESS NOTED OTHERWISE.

ABOVE COUNTERS: SAME AS FOR RECEPTACLES.

CONCRETE BLOCK WALLS: 40 INCHES ABOVE FINISHED FLOOR (DIMENSION MAY BE ADJUSTED SLIGHTLY, AS REQUIRED TO COMPENSATE FOR VARIABLE JOINT DIMENSIONS, SUCH THAT BOTTOM OF BOXES ARE AT BLOCK JOINTS).

WALLS WITH WAINSCOTING: 6 INCHES MINIMUM ABOVE WAINSCOTING, BUT NOT EXCEEDING 48 INCHES ABOVE FINISHED FLOOR.

16B WIRING DEVICES

THE CATALOG NUMBERS LISTED FOR WIRING DEVICES ARE GENERALLY FOR 20A RATED DEVICES. WHERE 15A RATED DEVICES ARE INDICATED ON THE DRAWINGS OR REQUIRED FOR CIRCUIT RATING LIMITATIONS, PROVIDE WIRING DEVICES EQUIVALENT TO THOSE SPECIFIED FOR 20A, BUT RATED FOR 15A.

ALL RECEPTACLES LOCATED OUTDOORS OR IN DAMP OR WET LOCATIONS: SHALL BE LISTED AS 'WEATHER RESISTANT', DESIGNATED BY A 'WR' ON THE FACEPLATE.

PROVIDE THE FOLLOWING WIRING DEVICES WHERE SHOWN ON DRAWINGS OR REQUIRED. MINOR CHANGES RELATIVE TO THE LOCATION OF ELECTRICAL EQUIPMENT MAY BE MADE TO COMPLY WITH STRUCTURAL AND BUILDING REQUIREMENTS AS DETERMINED IN THE COURSE OF CONSTRUCTION. PROVIDE ALL WIRING DEVICES OF THE SAME MANUFACTURER AND NOT MIXED ON THE PROJECT, TO THE MAXIMUM EXTENT POSSIBLE. PROVIDE COLOR OF TOGGLES AND RECEPTACLES AS REQUESTED BY THE ENGINEER: REFER TO DETAIL SHOWING RECEPTACLES TABLE.

SWITCH INSTALLATIONS IN DOOR/SIDE LIGHT FRAMES: DESPARD TYPE IVORY SWITCH OF THE FOLLOWING MANUFACTURERS:

PASS AND SEYMOUR ACD201-I

APPROVED EQUAL.

SWITCH AND PILOT INSTALLATIONS SHALL CONSIST OF ONE DESPARD TYPE IVORY SWITCH AND ONE DESPARD TYPE FLUSH 1/25 WATT NEON PILOT LIGHT, BOTH INSTALLED IN A SINGLE-GANG BOX WITH COVER PLATE, OF THE FOLLOWING MANUFACTURERS:

PASS AND SEYMOUR ACD201-IV SWITCH, AND 1475 PILOT LIGHT. APPROVED EQUAL.

16B SWITCH AND OUTLET COVER PLATES

SWITCH AND OUTLET PLATES: SATIN STAINLESS STEEL; BY THE SAME MANUFACTURER AS THE WIRING DEVICES, WHEREVER POSSIBLE. VERIFY DESIRED MATERIALS AND COLORS WITH ENGINEER BEFORE INSTALLATION. SWITCH PLATES IN UNFINISHED ROOMS AND SPACES: STAMPED STEEL, CADMIUM PLATED. INSTALL GROUPS OF SWITCHES UNDER ONE GANGED-PLATE, USUALLY HORIZONTALLY; OR, WHERE REQUIRED BY DETAILS, VERTICALLY. SET ALL COVER PLATES PLUMB, PARALLEL, AND FINISHED FLUSH WITH THE WALL.

16B DISTRIBUTION AND CONTROL EQUIPMENT

16B CIRCUIT BREAKERS IN EXISTING PANELBOARDS

PROVIDE NEW CIRCUIT BREAKERS FOR INSTALLATION IN EXISTING PANELBOARDS OF THE SAME MANUFACTURER AND TYPE AS THE EXISTING PANELBOARD CIRCUIT BREAKERS. SHORT CIRCUIT CURRENT INTERRUPTING RATING OF ANY NEW BREAKER MUST BE THE LARGER OF THE EXISTING PANEL RATING OR THE AVAILABLE FAULT CURRENT INDICATED ON THE DRAWINGS.

16B DISCONNECT (SAFETY) SWITCHES

DISCONNECT (SAFETY) SWITCHES: SQUARE D, SIEMENS, CUTLER HAMMER, OR GENERAL ELECTRIC FUSED OR NON-FUSED (AS INDICATED ON DRAWINGS OR REQUIRED) NEMA KS1. HEAVY DUTY. EXTERNALLY OPERATED, VISIBLE-BLADE SAFETY SWITCHES: NEMA ENCLOSURE TYPE INDICATED ON THE DRAWINGS OR SUITABLE FOR THE ENVIRONMENT IN WHICH INSTALLED. BASED ON FUSIBLE SWITCH AND FUSE SIZES INDICATED, INCLUDE CLASS R. J. OR L FUSE PROVISIONS AS

WHERE INDICATED, PROVIDE FUSIBLE SWITCHES PERMANENTLY LABELED AS SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT, WITH INTEGRAL AND SEPARATE NEUTRAL AND GROUND ASSEMBLIES, SUITABLE FOR THE SIZES OF CONDUCTORS INDICATED. DO NOT DOUBLE-LUG ANY TERMINATIONS NOT SPECIFICALLY LISTED AS SUITABLE FOR MORE THAN ONE CONDUCTOR.

PROVIDE SWITCHES WHERE NOT FURNISHED WITH THE STARTING EQUIPMENT, AT ALL OTHER POINTS REQUIRED BY NFPA 70, AND WHERE INDICATED ON THE

WHERE INDICATED, PROVIDE THE MOTOR ISOLATION DISCONNECT SWITCH WITH AN INTEGRAL AUXILIARY SWITCH, OPEN WHEN THE MAIN SWITCH BLADES ARE OPEN, AND WIRE IT INTO THE CONTROLLER TO DISABLE WHENEVER THE SWITCH IS OPEN.

16B MOTOR STARTING SWITCHES

MOTOR STARTING SWITCHES SHALL BE:

SQUARE D CLASS 2510, TYPE K GENERAL ELECTRIC TC2000 SERIES SIEMENS MS SERIES WESTINGHOUSE MST SERIES CUTLER HAMMER 9115 SERIES

MOTOR STARTING SWITCHES SHALL CONSIST OF A TOGGLE OPERATED TWO OR THREE POLE SWITCH. CONTACTS SHALL BE DOUBLE BREAK SILVER ALLOY, VISIBLE FROM BOTH SIDES OF THE SWITCH AND SHALL HAVE A DIRECT LINKAGE TO THE OPERATOR FOR POSITIVE BREAK. PROVIDE FLUSH MOUNTED UNITS IN FINISHED AREAS AND SURFACE MOUNTED UNITS IN UNFINISHED AREAS. STARTERS SHALL HAVE NEMA I GENERAL PURPOSE ENCLOSURE, UNLESS OTHERWISE INDICATED, AND BE RATED FOR THE MOTOR HORSEPOWER REQUIRED.

PROVIDE HANDLE GUARD WITH LOCKING PROVISIONS.

16B LIGHT FIXTURES, LAMPS AND BALLASTS

16B LIGHT FIXTURE LOCATIONS

LIGHT FIXTURES SHOWN ON THE ELECTRICAL DRAWINGS REPRESENT GENERAL ARRANGEMENTS ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE EXACT LOCATIONS. COORDINATE LOCATION WITH ALL OTHER TRADES BEFORE INSTALLATION TO AVOID CONFLICTS. COORDINATE LIGHT FIXTURE LOCATIONS IN MECHANICAL ROOMS WITH FINAL INSTALLED PIPING AND DUCTWORK LAYOUTS.

PROVIDE LIGHT FIXTURES AS SCHEDULED ON DRAWINGS, INCLUDING ALL LAMPS, ALL NECESSARY ACCESSORIES, MATERIAL AND LABOR TO SECURELY HANG, CLEAN, AND MAKE LIGHT FIXTURES COMPLETELY READY FOR USE. LIGHT FIXTURE MODEL NUMBERS SCHEDULED ON THE DRAWINGS SHOW ONLY THE MANUFACTURER, GRADE AND STYLE OF LIGHT FIXTURES REQUIRED. PROVIDE: ALL HANGERS, SUPPORTS, AND MISCELLANEOUS HARDWARE REQUIRED TO INSTALL LIGHT FIXTURES; PROPER TRIM TO FIT EACH CEILING CONDITION ACTUALLY ENCOUNTERED; ADDITIONAL TIE WIRES CONNECTED TO STRUCTURE TO CONFORM

TO SEISMIC REQUIREMENTS WHERE REQUIRED BY THE APPLICABLE BUILDING CODE.

PACKAGING OF LIGHT FIXTURES WILL NOT BE ALLOWED. ONLY THOSE LUMINARES LISTED IN THE LIGHT FIXTURE SCHEDULE, OR APPROVED IN ACCORDANCE WITH SUBSTITUTIONS OF THESE SPECIFICATIONS, WILL BE ACCEPTED. WHERE THE LIGHT FIXTURE SCHEDULE INDICATES AN ALLOWANCE FOR A SPECIFIC LIGHT FIXTURE, THE PRICE IS A CONTRACTOR PRICE. INCLUDE ALL ADDITIONAL COSTS FOR FREIGHT, LAMPS, AND INSTALLATION OF LIGHT FIXTURE AND LAMPS.

INSTALL FLUORESCENT LIGHT FIXTURES HUNG IN CONTINUOUS ROWS ON CHANNEL STRUTS SPECIFICALLY DESIGNED FOR THIS PURPOSE.

SURFACE-MOUNT ALL FLUORESCENT LIGHT FIXTURES LOCATED IN AREAS WITH A CEILING BUT WITHOUT SUSPENDED CEILINGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS. PROVIDE RIGID METAL SPACERS FINISHED IN WHITE ENAMEL BETWEEN THE TOP OF EACH LIGHT FIXTURE AND THE CEILING ABOVE TO MAINTAIN A 1-1/2-INCH SPACE. SPACERS SHALL BE APPROVED BEFORE INSTALLATION.

INSTALL ALL FLUORESCENT LIGHT FIXTURES LOCATED IN AREAS WITHOUT CEILINGS IMMEDIATELY BELOW THE ROOF-FRAMING MEMBERS, OR SUSPENDED FROM CHAIN HANGERS SUITABLE IN LENGTH TO PROVIDE THE INDICATED MOUNTING HEIGHT. HANGERS: "HYDEE" HANGER TYPE FOR OUTLET BOX MOUNTING, COMPLETE WITH GROUNDING RECEPTACLE, PLUG, 3-WIRE CORD AND NECESSARY CHAIN.

THROUGH WIRING OF RECESSED LIGHT FIXTURES, IN SUSPENDED CEILINGS, IS NOT PERMITTED. CONNECT EACH LIGHT FIXTURE BY A WHIP TO A JUNCTION BOX. PROVIDE CABLE WHIPS OF SUFFICIENT LENGTHS TO ALLOW FOR RELOCATING EACH LIGHT FIXTURE WITHIN A 5-FOOT RADIUS OF ITS INSTALLED LOCATION, BUT NOT EXCEEDING 6 FEET IN UNSUPPORTED LENGTHS.

16B EMERGENCY LIGHTING UNITS AND EXIT SIGNS

DESCRIPTION: SELF-CONTAINED UNITS COMPLYING WITH UL 924.

BATTERY: SEALED, MAINTENANCE-FREE, LEAD-ACID TYPE. THE BATTERIES SHALL BE OF SUITABLE RATING AND CAPACITY TO SUPPLY AND MAINTAIN AT NOT LESS THAN 87 1/ 2 PERCENT OF THE NOMINAL BATTERY VOLTAGE FOR THE TOTAL LAMP LOAD ASSOCIATED WITH THE UNIT FOR A PERIOD OF AT LEAST 1 1/2 HOURS, OR THE UNIT EQUIPMENT SHALL SUPPLY AND MAINTAIN NOT LESS THAN 60 PERCENT OF THE INITIAL EMERGENCY ILLUMINATION FOR A PERIOD OF AT LEAST 1 1/2 HOURS.

CHARGER: FULLY AUTOMATIC, SOLID-STATE TYPE WITH SEALED TRANSFER RELAY.

OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN POWER SUPPLY CIRCUIT VOLTAGE DROPS TO 80 PERCENT OF NOMINAL VOLTAGE OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROACHES DEEP-DISCHARGE LEVEL. WHEN NORMAL VOLTAGE IS RESTORED, RELAY DISCONNECTS LAMPS FROM BATTERY, AND BATTERY IS AUTOMATICALLY RECHARGED AND FLOATED ON CHARGER.

TEST PUSH BUTTON: PUSH-TO-TEST TYPE, IN UNIT HOUSING, SIMULATES LOSS OF NORMAL POWER AND DEMONSTRATES UNIT OPERABILITY.

LED INDICATOR LIGHT: INDICATES NORMAL POWER ON. NORMAL GLOW INDICATES TRICKLE CHARGE; BRIGHT GLOW INDICATES CHARGING AT END OF DISCHARGE

WIRE GUARD: HEAVY-CHROME-PLATED WIRE GUARD PROTECTS LAMP HEADS OR FIXTURES.

16B LAMPS

PROVIDE LAMPS AS INDICATED ON THE DRAWINGS FOR ALL LIGHT FIXTURES; OR, IF NOT INDICATED, AS RECOMMENDED BY THE LIGHT FIXTURE MANUFACTURER. IN ALL CASES, LAMPS SHALL BE COMPATIBLE WITH THE SPECIFIED LIGHT FIXTURE. ACCEPTABLE LAMP MANUFACTURERS: GENERAL ELECTRIC, OSRAM/SYLVANIA, PHILIPS, OR VENTURE.

ALL FLUORESCENT LAMPS SHALL BE MINIMUM OF 3500 DEGREES K, WITH A MINIMUM COLOR-RENDERING INDEX OF 70, UNLESS NOTED OR DIRECTED OTHERWISE. ALL FLUORESCENT LAMPS IN SALES AREAS SHALL BE 3000 DEGREES K WITH A COLOR-RENDERING INDEX OF 80.

ALL METAL HALIDE LAMPS IN SALES AREAS SHALL BE COATED, 3000 DEGREES K WITH A COLOR-RENDERING INDEX OF 70.

INCANDESCENT LAMPS: TYPE AND WATTAGE AS SHOWN ON THE DRAWINGS: RATED 130V UNLESS OTHERWISE SCHEDULED OR SPECIFIED.

16B BALLASTS

FLUORESCENT BALLASTS: LOW HEAT TYPE; THERMALLY PROTECTED AGAINST OVERHEATING; ETL-CBM, CLASS P TO MEET ALL REQUIREMENTS OF SECTION 410-73 (E) OF THE NFPA 70 AS A MINIMUM; COMPLY WITH THE NATIONAL BALLAST ENERGY LAW; 90-PERCENT POWER FACTOR OR GREATER; SOUND LEVELS NOT EXCEEDING CLASS A AMBIENT NOISE LEVELS. BALLASTS IN INDOOR LOCATIONS SHALL HAVE DISCONNECTING MEANS EITHER INTERNAL OR EXTERNAL TO THE LUMINAIRE.

INDOOR FLUORESCENT BALLASTS: ELECTRONIC TYPE SUITABLE FOR OPERATION OF T8 LAMPS: TOTAL HARMONIC DISTORTION LESS THAN 20 PERCENT; FREQUENCY OF OPERATION OF 20 KHZ OR GREATER WITH NO VISIBLE FLICKER; LINE TRANSIENT WITHSTAND RATINGS AS DEFINED IN ANSI/IEEE C62.41, CATEGORY A: MANUFACTURERS: ADVANCE REL/VEL SERIES OR APPROVED EQUAL BY MAGNETEK, MOTOROLA, OR OSRAM.

EXTERIOR AND LOW TEMPERATURE FLUORESCENT BALLASTS: SHALL BE ELECTRONIC TYPE SUITABLE FOR OPERATION OF F72T12/HO AND F96T12/HO LAMPS; SHALL HAVE A TOTAL HARMONIC DISTORTION LESS THAN 20 PERCENT; SHALL HAVE A FREQUENCY OF OPERATION OF 20 KHZ OR GREATER AND OPERATE WITH NO VISIBLE FLICKER; SHALL WITHSTAND LINE TRANSIENTS AS DEFINED IN ANSI/IEEE C62.41, CATEGORY A; SHALL HAVE A MINIMUM STARTING TEMPERATURE OF -20 DEGREES F; AND SHALL BE ADVANCE REL/VEL SERIES OR EQUAL OF MAGNETEK OR

EXTERIOR AND LOW TEMPERATURE FLUORESCENT BALLASTS: SHALL BE MAGNETIC TYPE SUITABLE FOR OPERATION OF T12 LAMPS; SHALL HAVE A MINIMUM STARTING TEMPERATURE OF O DEGREES F FOR RAPID START LAMPS AND A MINIMUM STARTING TEMPERATURE OF -20 DEGREES F FOR 800MA AND 1500MA LAMPS; AND SHALL BE ADVANCE REL SERIES OR EQUAL OF MAGNETEK.

COMPACT FLUORESCENT BALLASTS: SHALL BE THERMALLY PROTECTED AGAINST OVERHEATING; SHALL BE CLASS P; SHALL HAVE A MINIMUM 90 PERCENT POWER FACTOR; SOUND LEVELS SHALL NOT EXCEED CLASS A AMBIENT NOISE LEVELS; AND SHALL BE LOW HEAT TYPE. ALL BALLASTS SHALL BE BY ADVANCE. BALLASTS FOR 36W THRU 55W LAMPS SHALL BE MARK V ELECTRONIC TYPE.

HIGH-INTENSITY DISCHARGE (HID) BALLASTS (INCLUDES HIGH PRESSURE SODIUM (HPS) AND METAL HALIDE (MH)): SHALL HAVE A POWER FACTOR GREATER THAN 90 PERCENT; COMPLY WITH UNDERWRITERS LABORATORY (UL) 1029; PROVIDE NORMAL OPERATION AND LIGHT OUTPUT WITH THE INPUT VOLTAGE IS WITHIN ±10 PERCENT OF NOMINAL BALLAST RATING (EXCEPT HPS LAMPS SMALLER THAN 250W WHICH MUST HAVE THE INPUT VOLTAGE WITHIN +5 PERCENT); SHALL HAVE A MINIMUM STARTING TEMPERATURE OF -20 DEGREES F. PROVIDE ENCAPSULATED AND REMOTE TYPES WHERE INDICATED ON THE DRAWINGS.

EMERGENCY FLUORESCENT BALLASTS: SHALL BE BODINE B50 OR IOTA I-232 FOR FOUR-FOOT FLUORESCENT LAMPS; SHALL BE BODINE B30 OR IOTA I-160 FOR EIGHT-FOOT FLUORESCENT LAMPS; OR AS NOTED ON THE FIXTURE SCHEDULE OR ELSEWHERE ON THE DRAWINGS.

16B DIMMABLE LIGHT FIXTURES

FOR DIMMABLE LIGHT FIXTURES PROVIDE BOTH CONTROL AND POWER WIRING BETWEEN LIGHT FIXTURE AND CONTROL DEVICE AND BETWEEN LIGHT FIXTURES. QUANTITY OF LOW VOLTAGE AND LINE VOLTAGE WIRING AND WIRE TYPE SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE LIGHT FIXTURE AND CONTROL DEVICE DIMMING TYPES FOR COMPATIBILITY.

16B MISCELLANEOUS ELECTRICAL

16B WIRING OF MECHANICAL EQUIPMENT

PROVIDE ALL RACEWAYS AND POWER WIRING FOR ALL DIVISION 15 EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, INCLUDING, BUT NOT LIMITED TO, PUMPS. WATER HEATERS, AND HVAC EQUIPMENT, AND ALL LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15. CONNECT PER MANUFACTURERS' WIRING DIAGRAMS. COORDINATE WITH DIVISION 15 FOR DISCONNECTS FURNISHED WITH EQUIPMENT, AND PROVIDE ALL DISCONNECT SWITCHES AS REQUIRED. AFTER INSTALLING WIRING, VERIFY THAT EACH MOTOR LOAD HAS THE CORRECT PHASE ROTATION.

VERIFY THE ACTUAL "MAXIMUM OVERCURRENT PROTECTION" (MOCP) DEVICE RATINGS AND "MINIMUM CIRCUIT AMPACITY" (MCA) CONDUCTOR SIZING FOR MECHANICAL EQUIPMENT FROM THE EQUIPMENT NAMEPLATE. BASE ELECTRICAL INSTALLATIONS ON ACTUAL REQUIRED AMPERAGES, WHICH MAY VARY SOMEWHAT FROM THE CONDUCTOR AND EQUIPMENT SIZES SHOWN ON THE DRAWINGS; HOWEVER, IN NO CASE, REDUCE THE SIZE OF CONDUCTORS INDICATED ON THE DRAWINGS WITHOUT AUTHORIZATION FROM THE ENGINEER. PROVIDE PROPERLY SIZED ELECTRICAL WIRING AND EQUIPMENT WITHOUT EXTRA COST TO THE OWNER. NOTIFY THE ENGINEER OF ALL CHANGES REQUIRED IN THE ELECTRICAL INSTALLATION DUE TO EQUIPMENT VARIANCES SO THAT THE EFFECTS ON FEEDERS, BRANCH CIRCUITS. PANELBOARDS. FUSES AND CIRCUIT BREAKERS CAN BE CHECKED PRIOR TO PURCHASING AND INSTALLATION. BE RESPONSIBLE FOR COORDINATING WITH DIVISION 15 TO VERIFY THE ACTUAL AMPACITIES AND CORRECT SIZES OF ALL CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICES FOR ALL EQUIPMENT, AND CORRECT OVERLOAD HEATERS FOR ALL MOTORS, WHEN STARTERS ARE PROVIDED UNDER DIVISION 16.

16B MISCELLANEOUS EQUIPMENT AND CONNECTIONS

PROVIDE WIRING OF FIRE EXTINGUISHING SYSTEM FOR EXHAUST HOODS, INCLUDING, BUT NOT LIMITED TO, ELECTRICAL INTERLOCK OF AUTOMATIC FUEL SHUT-OFF VALVES AND/OR PROVISION OF SHUNT TRIP BREAKERS FOR SHUT-OFF OF ELECTRICAL EQUIPMENT UNDER HOODS.

ALL WIRING AND CONNECTIONS FOR REFRIGERATED CASES AND BOXES, INCLUDING LIGHTING, SUPERSTRUCTURE LIGHTING, AND CONTROL CABLE AND WIRING AS REQUIRED BY REFRIGERATION WIRING DIAGRAMS.

ALL WIRING AND CONNECTIONS TO ILLUMINATED CASES.

ALL WIRING AND CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS, INCLUDING, BUT NOT LIMITED TO, BAKERY EQUIPMENT, DELI EQUIPMENT, MEAT ROOM EQUIPMENT, KITCHEN EQUIPMENT, CHECKSTAND AND SCANNERS, EXHAUST HOOD FIRE EXTINGUISHING SYSTEM, ETC. INSTALL SCAN SYSTEM ELECTRONIC COMMUNICATION CABLE IN UNDERFLOOR DUCT (CABLE PROVIDED BY OTHERS).

ALL RACEWAYS, AND ALL WIRING AND CONNECTIONS OF DEVICES TO ENERGY MANAGEMENT SYSTEM THAT ARE NOT THE RESPONSIBILITY OF DIVISION 15.

ALL WIRING AND CONNECTIONS OF EXIT DOOR ALARMS.

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SPECIFICATIONS

VA CMOP EYE WASH AND WELDING HOOD

10.16.2015

5000 S 13TH STREET, LEAVENWORTH, KS 66048

Project Title

VA770-15-P-0799 A/E Project Number 2015-06

V/A Project Number

Consolidated Mail Outpatient Pharmacy 5000 S 13TH STREET, LEAVENWORTH, KS 66048

VA CMOP

Drawing Number

Department of

Veterans Affairs

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